trademarks and patents, recognize that protection will encourage invention and innovation.

Studies of new products demonstrate the benefits of being first in presenting a new product on the market.[10] In the unpatented world, pioneer firms capture a relatively large market share during the first months of introduction. In short order, other firms duplicate the product and bid away much of the pioneer's market share from the pioneer firm. Sometimes it takes years for the pioneer to lose its initial standing as the largest firm in the industry, but the more competitive the market, the shorter the time it takes for this initial standing to erode. The initial standing serves to reward the pioneer for taking the risks and proving to the industry that this product is profitable to produce.

With CEI plans, there exist potentially smaller gains earned by BOCs as the initial risk takers. Other ESPs are not required to file CEI plans, which gives these firms the full benefit of the pioneer status. Although CEI plans may offer more assurance that the BOCs do not engage in access discrimination, they potentially destroy the gains necessary to introduce many new products. The CEI plans, therefore, can reduce consumer benefits through reductions in new product development while only potentially adding additional assurance that BOCs do not withhold access to LEC basic services. As administered, the CEI plans do not seem to have curtailed innovation, and today's innovations are being led by the BOCs. However, the potential exists in which CEI plan requirements can impede risk taking among the BOCs and eliminate the deployment of valuable enhanced services.

III. Alleged Benefits from Structural Separation

As outlined in the introduction, proponents of structural separation point to three potential benefits. First, the regulatory theory behind structural separation is based upon the presumption that with separated facilities and manpower among the BOCs, regulatory authorities will be more efficient in observing attempts by BOCs to discriminate in the provision of unbundled services and access. Proponents of structural separation argue that since the BOCs control LEC basic services, there is

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[10]See Urban, Glen L., Carter, Theresa, Gaskin, Steven, and Zofia Mucha, "Market Share Rewards to Pioneering Brands: An Empirical Analysis and Strategic Implications," *Management Science*, Vol. 32, June 1986, pp. 645-659.

substantial risk that certain unbundled services either will be withheld from the ESPs or will be provided on a non-equal basis, giving the BOCs an economic advantage in the provision of the affected enhanced services. Additionally, some services may remain unbundled even though the ESPs would bring new enhanced services to the marketplace if they had proper access.

Second, proponents see structural separation as a vehicle to protect the LEC basic service rate payer from the accounting abuses of paying for enhanced services. They claim that the current joint cost accounting allows the BOCs to move enhanced service costs into the regulated LEC basic service rate base.

Third, ESPs fear that not only will the BOCs shift enhanced service costs into the LEC basic service rate base, they will use the resulting windfall profits to subsidize the price of enhanced services, enabling the BOCs to monopolize the enhanced services market. This section investigates each of these three alleged benefits of structural separation.

A. Structural Separation and Assurances of Non-Discriminatory Access

Structural separation forces the BOCs to develop completely separate operations for the provision of enhanced services. It would place the BOCs on the same footing as the ESPs in the provision of enhanced services since a separate operation would be requesting LEC basic services rather than the integrated operation. Proponents of structural separation argue that the incentive of BOCs to engage in access discrimination would somehow be changed. Structural separation would help ensure equal access to LEC basic services and would presumably result in a more competitive market for enhanced services.

1. Access Discrimination is Prevented

Proponents of structural separation argue that access discrimination is a byproduct of integrated personnel and facilities. Presumably, with integrated operations and common goals, the BOCs will elect to engage in access discrimination whereas with structural separation such an election would not be made. The imposition of structural separation, therefore, would alter economic incentives.

In order to fully address these claims the issues of opportunity and incentive must be addressed. When, if ever, is it in the interest of the BOCs to access discriminate in the sale of LEC basic services? What economic advantage is to be gained from such access discrimination and what factors determine the extent, if any, of the discriminatory access advantage? To address these questions it will prove useful to view the BOC as a multi-product firm producing two products, LEC basic services and enhanced services. Since enhanced services are produced using LEC basic services as an input, the demand for LEC basic services is a function of enhanced services demand.

Proponents' arguments depend, in large part, on the presumption that the BOCs are monopoly providers of LEC basic services. If the BOCs were unconstrained monopolies in the LEC basic services market, and enhanced services were a downstream product, then the BOCs could obtain all of the monopoly rents by assuring that the enhanced services market is competitive. Given that the LEC basic service market is regulated, then the question arises as to whether or not there are additional profits to be had by differentially supplying LEC basic services to their own enhanced services unit versus other ESPs. However, as we shall demonstrate below, for this part of the problem, structural separation is no cure. The incentive to differentially supply LEC basic services would not be affected by whether or not the BOC enhanced services were supplied by an integrated or structurally separated wholly-owned subsidiary.

As a background to this discussion, it is important to consider changes in the market for LEC basic services. With changing technology, entry into the provision of LEC basic services is less difficult today. Some proponents of structural separation, such as MCI, are entering the market for LEC basic services. The discriminatory provision of LEC basic services to competing ESPs further encourages entry. Competing ESPs have the incentive and the ability to vertically integrate into the upstream market, eliminating the BOCs position as the sole suppliers. With new technologies on the horizon (and existing networking for major city business customers), the threat of entry in the larger markets is substantial.

The BOCs as the dominant suppliers of LEC basic services have in their hands a product that has experienced a large increase in value as a result of changing technology. For a century, the only two uses of the BOCs' wire connections have been as the supply of interconnections in the local exchange and as bridges to the long lines for long distance calling. Technological change has given

this old capital new opportunities while at the same time introducing competing resources. If the BOCs are to enhance or even maintain the value of their basic service connections, they must aggressively price and market them. Only through unbundling and ONA plan compliance will the BOCs maintain their position as the major suppliers of LEC basic services.

2. Necessary Conditions for Advantageous Discriminatory Behavior.

The purpose of this section is to identify the conditions necessary for discriminatory access to be in the interest of a BOC, where discriminatory access is defined as a BOC supplying competitor ESPs with delayed access or less unbundled LEC basic services than the timing or level of unbundling the same BOC supplies to its integrated ESP. These discriminatory access necessary conditions would have to be satisfied before discriminatory access would be an economically rational response to the entry of an independent ESP.

There are three necessary conditions for discriminatory access in LEC basic services to be in the interest of the BOCs: 1) regulation of local service prices must result in less than profit maximizing prices, 2) discriminatory access must result in increased revenues in the sale of BOC supplied enhanced services that more than offset the loss in revenues from restricted access, and 3) discriminatory access must be difficult to detect so that regulatory authorities and courts cannot impose corrective measures.

Necessary Condition 1

Economic theory argues that if a vertically integrated firm produces one product for which it possesses market power, it will maximize profits if the other market is perfectly competitive. That is, the firm will capture its monopoly profits in only one market. As applied to the BOCs, if prices in the market for LEC basic services equal profit maximizing monopoly prices, there is no incentive to restrict sales of LEC basic services to competing ESPs.[11] The BOCs will not maximize profits by

[11]There is existing debate regarding the incentive of a BOC to transfer costs from the provision of enhanced services to the provision of LEC basic services in order to overstate the rate base. The arguments presented herein assumes that the BOC knows the true costs of enhanced services and prices enhanced services on the basis of these true costs, regardless of the assignment of accounting costs.

restricting the provision of LEC basic services at profit-maximizing prices. However, the ability of a BOC to monopoly price in the LEC basic services market is subject to regulatory control. It is plausible that the BOCs are forced to price LEC basic services below the profit-maximizing price.

In order for discriminatory access to be profitable for BOCs, regulated prices in LEC basic services must be constrained below profit-maximizing prices. This condition is more likely to have been met in the past than in the present. Competition in the form of cellular technology, by-pass technology privately-owned switching equipment, and even future competition from the licensing of new FCC frequencies necessarily decrease profit maximizing prices in LEC basic services markets. It is not clear that **necessary condition 1** is currently met, and the likelihood that necessary condition 1 will be met in the future is less likely.

Necessary Condition 2

In order for the discriminatory access to be profit maximizing the loss in revenue from LEC basic services operations must be more than offset by the increase in revenues for enhanced services operations. How likely is such a result? We know from past studies that the elasticity of market demand for LEC basic services is very inelastic; this implies that the reduction in the quantity of LEC basic services demanded will be small if the BOC demand for LEC basic services is viewed as the market demand (the usual assumption because of the so-called monopoly position of the BOCs in the local market). But the market LEC basic services demand schedule is not the relevant schedule. Because of the increasing threat of local exchange bypass and other technological changes permitting entry, the elasticity of an BOC's demand for LEC basic services is much greater than the market demand elasticity. Other operators are ready to compete in the LEC markets.[12] Thus, the practice of discriminatory access can be expected to significantly impact LEC basic services demand. Even with regulation, a loss of LEC basic services market share will adversely affect the BOCs. In the long run the loss of market share will reduce capital and total profits. The retention of the BOCs' position

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[12]The *Wall Street Journal*, April 3, 1995, reports an agreement between Ameritech and the Justice Department wherein Ameritech makes it easier for rivals to compete in its local markets in exchange for allowing Ameritech to enter the long distance market. Both long distance carriers and LECs are vertically integrating into existing markets.

in the LEC basic service market is critical to maintaining the value of their historical position in wired service.

The bottom line of the above discussion is that there is a declining probability that **necessary condition 2** will be met. Any BOC practicing discriminatory access will ultimately lose significant LEC basic services profits and lose value in its base resource without gaining significant enhanced services profits as compensation. In the long run, this condition is probably not met.

Necessary Condition 3

For a strategy of discriminatory access to be in the interest of any BOC, the BOC cannot live in a glass house. The likelihood of detection of discriminatory access must be minuscule under existing rules. The competing ESPs must not be able to detect any difference in LEC basic services purchased within the BOC and LEC basic services purchased among competing ESPs. No competing ESP must be able to detect significant delays in access once requests are filed. No competing ESP must be able to detect the establishment of cost-inducing protocols or more aggregate bundling that might be imposed by the BOCs. In essence, the competing ESPs cannot know that access discrimination is taking place.

In fact, with existing safeguards, BOCs provide access to LEC basic services from glass houses. ONA provides significant disclosure regarding available services and those LEC basic services demanded internally. Participation in industry meetings, such as the Information Industry Liason Committee (IILC), provide industry access to the BOC's staff who are unlikely to even know about alleged discriminatory corporate strategies. Competing ESPs occasionally employ former BOC technical staff as a means of capturing needed expertise and obtaining information important in developing their own corporate strategies. The industry evidence suggests that the BOCs do operate in glass houses, and that competing ESPs are quick to file allegations. In short, the BOCs operate in full view, surrounded by actual and potential competitors in the enhanced services market. Detection of access discrimination would be quick and promptly reported.

Once access discrimination is detected, competing ESPs are well supported with existing regulations and statutes. The deterrent to discriminatory behavior is twofold. First, the affected parties can and will submit complaints to the regulatory authorities who must continually review

methods of compliance enforcement. Any change in the regulatory environment that would eliminate any cost complementarity enjoyed by a BOC would lead to significant reductions in profits. With an anticipated multi-billion dollar industry in development, the financial costs of triggering changes in regulations would be substantial. Second, the affected parties can rely upon the courts to enforce antitrust laws that protect access to essential facilities. These remedies are in place and provide protection equal to or beyond what other firms enjoy in protecting their rights of access to essential facilities.

The plea for structural separation in order to deter access discrimination is a plea for assurances that have not been provided to any other industry, including those dependent upon essential facilities. The legislatures and the courts obviously feel that the antitrust laws alone are sufficient protection. In the enhanced services market, the potential for additional regulatory controls (structural separation) add to an already burdened cost of non-compliance. The ESPs currently enjoy substantial protection.

If any of the BOCs had the mistaken idea that discriminatory access could be used without detection, the action against Bell South and the result of that legal action should have corrected the mistake. Thus, any systematic attempt at discriminatory access will be discovered by competitor ESPs. The treble damage provision of antitrust actions makes easily discoverable antitrust actions unprofitable. As a result, **necessary condition 3** is not met.

3. Structural Separation and Incentives for Discriminatory Access

The essential issue is, would a structurally separate BOC enhanced services subsidiary reduce the incentive of the BOCs to discriminate in favor of its own operations? The answer is no. The benefits of discriminatory behavior are the same whether or not the BOC's enhanced services subsidiary is structurally separate.

Thus, all of the costs and benefits of discriminatory access apply equally to any BOC that operates its enhanced services through a fully integrated division or as a completely structurally separate company. The shareholders of the parent BOC deserve to have the entire firm operated to maximize profits. Indeed, if a BOC is not operated so as to maximize profits, corporate takeover threats and stockholder revolts will assure that such non-profit maximizing behavior will not persist.

Thus, if through a discriminatory access strategy an integrated BOC will lose less in LEC basic services profits than it gains in enhanced services profits, then a structurally separated BOC will find a discriminatory access strategy just as profitable.

By the same token, if at least one of the three necessary conditions for the profitability of discriminatory access fails to hold for a structurally separated BOC, then those same necessary conditions fail to hold for a fully integrated BOC.

4. The Absence of Access Discrimination

To enhance the provision of LEC basic services to the ESPs, U S WEST participates in the actions of the IILC. The IILC serves the BOCs and the ESPs by providing a forum in which consensus can be reached on appropriate issues without the involvement of regulators. It serves as a place in which ideas and concerns can be exchanged and possible solutions identified. The IILC represents an information marketplace wherein requests regarding unbundling and individual LEC basic services can be coordinated. This process enables BOCs to better service the downstream ESPs, both in identifying specific capabilities to be provided (unbundled) and to evaluate alternative methods of providing more capabilities. Uniformity of service offerings can be established faster resulting in a more rapid growth in the enhanced services market. U S WEST's time and effort spent in participation in the IILC reflects a desire to offer LEC basic services rather than to restrict sales to competing ESPs.

To date, the IILC has improved overall efficiency in the provision of demanded LEC basic services. Both technical and investigative work have been conducted. Information has been exchanged across the BOCs in the most efficient method of offering basic capabilities (unbundling). For instance, U S WEST developed the Two-way DID with call transfer service. The services developed by U S WEST have been documented by the IILC and shared with other BOCs so that these unbundled services could be made available by other LECs upon request. In addition, the FCC has requested the IILC to examine industry needs and major issues to be addressed in network unbundling. Both BOCs and ESPs work toward uniformity so that those unbundled services developed in one region of the country will be similar to those in other areas of the country. This involvement and participation by U S WEST appears at odds with the presumption that U S WEST

seeks to limit access to unbundled services and provides LEC basic services only on a discriminatory basis.

Most importantly, customers of U S WEST have been provided with every reasonable effort to meet their requests. U S WEST and other BOCs have differentiated requests for unbundling and have effectively served the enhanced services industry. To date, no complaints against U S WEST have been filed by competing ESPs for the refusal to provide an unbundled service. This is strong evidence that appropriate unbundling, as prescribed by ONA, is taking place.

5. Market-driven Unbundling

It is important to understand that the unbundling process requires significant expense, and some unbundling cannot reasonably be achieved with existing technology. Capturing information within an existing system is not always straightforward. Software typically must be modified, requiring system modification, error detection and correction, systems construction for repairs, utilization measurement, billing, and compatibility with other operations. Significant resources are expended in the unbundling process. In some instances it is less costly to offer packages of LEC basic services rather than individual services on an a-la-carte basis.

Proponents of structural separation appear to seek "complete" unbundling as though it were in the interest of consumers. In fact, unbundling can progress only with the advance of technology. New basic services are being "discovered" as computer software is improved and updated. Moreover, the mere identification of an LEC basic service does not necessarily mean that it should be unbundled.

Appropriate unbundling is driven by the employment of an LEC basic service as input into the production of a marketable enhanced service. Effective demand for unbundled basic services must be a derived demand from the provision of enhanced services. If there is no downstream demand for the related enhanced service, there is no effective demand for the unbundled basic service. To advance the unbundling process as an end to itself is to incur costs that must ultimately be paid by consumers of enhanced services for which there is no compensating benefit. Unbundling must be market driven if consumers are to receive maximum benefit from enhanced services.

B. The Avoidance of Joint Cost Manipulation

A common complaint with integrated operations is that BOCs will have strong incentives to move the costs of enhanced services into the basic service rate base, thereby artificially increasing the price paid by consumers of basic service. In contrast, structurally separate facilities, management, and operations would preclude such a possibility. Thus, structural separation would presumably eliminate the welfare loss resulting from inflated prices of basic service.

The analysis in Appendix B suggests that the scope for joint cost manipulation is severely circumscribed by several factors. First, it may not be in the BOCs' interest to raise the price of basic service. Increasingly, BOCs are facing entry into the local basic service market, and with the advent of cellular technology, BOCs may feel constrained to hold down the price of basic phone service in order to prevent further erosion of their dominant market shares. But even assuming it is profitable to raise basic service rates by manipulating joint costs with enhanced services, there remains the question of whether existing joint cost accounting techniques would allow such manipulation. The review of these accounting techniques in Appendix B suggests that accounting procedures for separating joint costs are quite explicit and leave little scope for manipulation. For example, employees are designated as to whether they work in basic services, enhanced services, or both. The latter are required to allocate their time based on their work effort in both activities. Similarly, space occupied by enhanced services must be allocated strictly to enhanced services. Finally, under existing audit restrictions, an independent auditor is required to verify the appropriateness of the cost allocation.

To assess the danger of the shifting of these costs one must consider the extent to which a state rate commission is incapable of detecting these costs adjustments. Since these rate commissions have been functioning for decades, it is not appropriate to conclude that these state rate commissions are completely ineffective. For example, BOCs have been permitted to competitively price LEC basic services in order to compete with by-pass technology. Competitors of LEC basic services argued before rate commissions that the BOC could cross-subsidize and predatorily price these competing services. Rate commissions have been examining and ruling on these issues for at least ten years. In the Texas Public Utility Commission (PUC), Docket No. 6771, ROLM Corporation challenged

the method by which Southwestern Bell determined its pricing under its ESSX Custom Tariff. ROLM is a manufacturer of PBX systems which compete with Southwestern Bell's ESSX systems. Both permit the large-scale user to have both inward and outward dialing capability plus intercom calling, call forwarding, and three-way calling. The Texas PUC investigated the arguments. Southwestern Bell was requested by the PUC to provide evidence concerning alleged cross subsidization of an unregulated service. The evidence was presented and understood by the Administrative Law Judge. Importantly, the PUC did not impose any inefficiencies upon the provision of these custom services, recognizing the capabilities of the Commission and its staff to detect any cross-subsidization that would injure public benefits.

Because of the safeguards from existing accounting procedures as outlined in Appendix B, it appears that the likelihood of moving more than 5% or 10% of enhanced service costs into the basic service rate base seems extremely problematic. In 1994, total enhanced service costs represented only about 2.1% compared to the costs of basic service. Assuming 5% of enhanced service costs to be shifted into basic services, this would imply that in 1994, the costs of basic service would be inflated by at most .1%. As shown in Appendix B, the resulting welfare gain from avoiding inflated basic service prices through structural separation tends to be *de minimus*. On a per-access line basis, the welfare gain would appear to be about one ten thousandth of one cent per month. Alternatively for the whole U S WEST region, the annual welfare gain totals $215[13]. Furthermore, if allowance is made for plausible cost complementarities, the welfare gain from eliminating over-pricing basic service is swamped by the welfare loss accompanying the lost cost complementarities from structural separation.

C. Cross Subsidization with Enhanced Services Priced Below Cost

Independent providers fear that the BOCs might choose to deliberately price enhanced services below cost, using the excess profits generated from inflating the basic service rate base.

[13]For details of these calculations, see Appendix Table B.1.

Accordingly, independent providers of enhanced services might be unable to compete with the BOCs, leaving the BOCs with virtual monopoly control of the enhanced service market. Whereas the usual monopoly condition is a price greater than costs, in this case the monopoly position would arise because the BOC would choose to price enhanced services below costs, making it unattractive for competitors to enter. Even though consumers would benefit from lower enhanced service prices, economic efficiency would not be served since welfare losses would occur from both an artificially high price for basic service and an artificially low price for enhanced services. This situation is entirely analogous to the pattern of cross subsidization often observed in regulated markets. For example, long distance prices were set above marginal costs generating large profits which were then used to subsidize the price of local service. This situation produced welfare losses in both the long distance and local service markets.

But should independent enhanced service providers fear that cross subsidization would occur in the enhanced service and basic service markets? The parallel between the long distance/local service and basic service/enhanced service markets does not hold because in the latter case, only the basic service market is regulated. The prices and profits from enhanced services are unregulated, and this fundamentally alters the incentive to transfer profits earned in the regulated basic service market to the unregulated enhanced service market. When profits in both markets are regulated, the firm does not incur any cost for subsidization because even though it is losing money in the subsidized market, regulators assure that the firm's overall return is fair. But when the subsidized product is unregulated, every dollar spent in pricing its service below cost reduces the firm's profitability. No profit maximizing firm would choose to take excess profits earned from a regulated product (basic service) and use those profits to subsidize an unregulated product (enhanced services). The profit maximizing strategy is to independently maximize profits in both markets, which means pricing enhanced services at or above marginal costs, not below marginal costs.

Empirical confirmation of this theoretical proposition based on simple profit maximizing behavior is contained in numerous industry statistics. Looking across a variety of enhanced service markets, we do not observe monopoly by the BOCs. Using 1994 revenue data, Booz-Allen utilizes data from various sources to show that BOCs' share of various enhanced services ranges from

effectively zero in the E-Mail market to 45% in the voice messaging enhanced services market.[14] Even in the voice messaging market, the market share compares BOCs with other ESPs, excluding direct sales of consumer voice messaging equipment which accounts for another $1.5 billion annually. Looking at the overall market, the BOCs account for less than 25% of sales.[15] This is hardly the type of dominance consistent with the cross subsidization hypothesis. Furthermore, with the vigorous entry of the BOCs in voice messaging, the average price paid for voice messaging has declined almost 50% since 1990.[16]

Clearly, rival producers of enhanced services do not have to fear BOC predatory pricing below costs. Predatory pricing of enhanced services by the BOCs would be self-defeating both in the short as well as the long run since it would be costly to eliminate rivals in the short run and any attempt to raise prices later in excess of costs to makeup for past lost profits would only be met by new entry of rival ESPs.

To summarize, the ESPs need not fear predatory behavior by the BOCs leading to cross subsidization of enhanced services. As discussed previously, if the BOCs succeed in shifting some enhanced service costs into the basic service rate base and thereby earn excess profits in this market, there are no additional welfare effects in the enhanced service market. Neither available market data or profit maximizing firms behavior would lead BOCs to subsidize the price of enhanced services.

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[14]See Appendix C, Exhibit 1.

[15]See Appendix C, Exhibit 2.

[16]See Appendix C, Exhibit 3.

IV. Overall Implications of Cost-Benefit Analysis

A. No Compelling Reason for Structural Separation

The preceding analysis of costs and benefits of structural separation clearly demonstrates that the costs of structural separation are potentially very large, whereas the benefits of separation are limited to safeguarding against access discrimination and avoiding the welfare losses attendant with inflated basic service prices. The costs of structural separation manifest themselves not only in the one-time setup costs of moving to new, separate facilities, but there are important ongoing cost complementarities that will be lost with structural separation. But even more important than the day-to-day saving of being able to use the same personnel and equipment to perform both LEC basic services and enhanced services and to allow convenience-minded customers the opportunity to purchase multiple services from the same sales person, the biggest efficiency losses are likely to fall in the area of cost complementarities in joint R & D. Research scientists working on improved methods of providing LEC basic services use the same techniques as scientists working on enhanced services. Attempting to split the two activities with no interchange between the two groups defies all economic logic. Under joint R & D, the advances in the telecommunications industry are the envy of most industries. A wide spectrum of new enhanced services have sprung from this environment, and to cripple this engine of technological advances would have serious economic repercussions in the future.

Whereas the costs of structural separation are large, the benefits appear small and achievable without requiring structural separation. Basically, there are three alleged benefits from structural separation. First, structural separation would presumably offer additional guarantees that independent enhanced service providers would receive equal access to the necessary interface services required to provide enhanced services. As discussed in Section III, ONA provides clear-cut guidelines for BOC personnel that assure equal access. Furthermore, with the enormous potential future market in enhanced services, it would appear to be extreme folly for a BOC to discriminate against an ESP, since the courts could reimpose the ruling in Computer Inquiry II, requiring structural separation or

go even further, preventing all BOC involvement in the enhanced services market. In addition to these incentives against access discrimination, the antitrust laws with treble damages provide protection against access discrimination under the essential facilities doctrine. In sum, structural separation would appear to add very little at the margin to reduce the incentive to practice access discrimination. Structural separation would not eliminate the incentive to discriminate. The real deterrence comes from non-structural policies such as ONA, the threat of court-mandated separation, or prohibition, and treble damages under the antitrust laws.

The second alleged benefit of structural separation is that it would eliminate the BOCs' ability to inflate the basic service rate base by loading in the costs of enhanced services. Indeed, of the three alleged benefits of separation, it seems clear that structural separation would prevent basic service rate manipulation. Any gain is illusory because there is little or no scope for joint cost manipulation.

The third alleged benefit of structural separation is that it would prevent predatory behavior by the BOCs and the cross subsidization of enhanced service prices at the expense of basic service customers. Concerns of predatory behavior have no basis as a profit maximizing strategy, nor is there any evidence to support such a claim.

B. Implications about the Desirability of a "Level Playing Field" for Enhanced Service Providers

Structural separation would of course eliminate the cost complementarities and R & D advantages of joint production. The resulting separate BOC enhanced services subsidiaries would find that they were no more efficient than other ESPs. Indeed, large firms like MCI might actually have a substantial R & D advantage over BOC enhanced service subsidiaries. Advocates of a "level playing field" would applaud the resulting market structure since it is one that competition would surely thrive in. In contrast, with integrated provision of enhanced services, the ESPs have found those market niches where cost complementarities are not particularly strong and can be overcome by a lean, efficient firm organization. The integrated BOCs are likely to be the main source of new product innovation while the ESPs are likely to be effective imitators, quickly eroding the short term monopoly advantage that goes to the successful innovator.

The fallacy of the "level playing field" analogy is that it unnecessarily wastes resources by raising the BOCs' costs. Furthermore, even though the existing field may not be entirely level, it is not so unlevel as to prevent a vigorous role for the ESPs. Particularly in the enhanced service market, the firm structure that is most efficient is the one that generates the greatest rate of technological breakthroughs in providing new and improved enhanced services. Supporters of the "level playing field" concept overlook the tremendous efficiency generating properties of the current integrated structure.

C. Vigorous Endorsement of ONA's Prescribed Unbundling of Access Services Coupled with Marginal Cost Pricing

The fact that policy makers would be ill-advised to require structural separation does not mean that there is no potential for efficiency-enhancing regulations. The FCC's ONA policy of promoting the unbundling of access services is an excellent example of a policy change which has the effect of promoting a "level playing field" without robbing the BOCs of the cost complementarities from integrated operations. As the enhanced services market evolves, individual suppliers of enhanced services may only require one or a few individual access services. Under ONA they are guaranteed the right to purchase just these services at the long-run incremental cost of providing them. With unbundling, these services are offered on an a la carte basis at prices reflecting their costs. Furthermore, unbundling under ONA assures that all providers of enhanced services (both ESPs and BOCs) pay the same price for. Unbundling prevents the BOCs from gaining an artificial cost advantage vis-a-vis the ESPs because the BOC enhanced service firm can utilize more of the services provided in the bundle than can individual ESPs, who may only need some components of the bundle.

Although one must recognize the importance of unbundling in the development of enhanced services, one must also recognize that the costs of providing individual components of a bundle may exceed the costs of providing them in a bundle. With technological advances, these costs may change in the future as software used in the provision of access services is upgraded. Nevertheless, as long as both individual access components and bundled combinations are offered based on their costs, economic efficiency is promoted.

Clearly, unbundling under ONA promotes competition and eliminates a potential source of access discrimination. Furthermore, it is desirable that the individual services be priced at their marginal costs. Marginal cost pricing of each service means that each supplier of enhanced services incorporates the true social cost of the inputs into its costs. With competition among enhanced service providers, the prices of enhanced services will reflect their social costs leading to the optimal quantities of each being supplied to the market.

V. General Economic Lessons About Firm Structure, Competitive Forces, and Regulation

In this section we explain the economics of firm structure pertinent to the issue at hand. In particular, we review the economic forces that determine the optimal structure of firms, and we examine relevant experience in other industries in which regulatory subsidiary structures and related regulations have been imposed. The evidence from other industries indicates that regulations have frequently resulted in different, less efficient industry and firm structures than market forces would foster. The lifting of regulations offers a chance to observe how industry structure changes in response to unfettered market forces.

A. Determinants of Firm Structure

In the absence of regulatory constraints, market forces ensure that firms efficiently organize and select the proper firm structure. By firm structure, the firm must choose the extent to which it vertically integrates, produces products separately or jointly, and manages the firm through a subsidiary or integrated organizational structure. Modern industrial organization argues that economizing on transaction costs underlies each of these choices.[17] Firms that first select the optimal

[17]Williamson, Oliver E., Markets and hierarchies: analysis and antitrust implications: a study in the economics of internal organization. New York: Free Press, 1975.

organizational structure will reap the profits of this selection, and competitors will quickly follow suit. Overall, fewer resources will be utilized in the production of the output, and consumers will benefit from these efficiencies.

1. Transactions Costs and Cost Complementarities

Just as a major purpose of a market is to reduce transactions costs between buyers and sellers, transaction costs shape the internal structure of the firm. Transactions costs help explain why firms vertically combine, produce joint products, and choose certain organizational structures. Firms integrate vertically upstream (i.e., by producing products previously purchased as an input) or downstream (i.e., by producing those products that use the firm's product as an input) because the transaction costs of internal transactions are less than the transaction costs of market transactions. For example, Ford Motor's decision to produce certain car components and to purchase others ultimately hinges on transaction cost considerations. Internal provision of a good or service may be beneficial when market contracts would have to be written very specifically to accomplish the task at hand, and contract performance may be difficult to define and enforce. For example, in the production of copper anodes (sheets of relatively pure copper) from scrap copper, refineries need a steady flow of copper scrap to maintain efficient production rates. Consequently, it is not unusual for a refining operation to establish its own scrap gathering business to ensure a steady flow of copper scrap to the factory. Consequently, it is sometimes easier to produce in a vertically integrated structure than to incur the difficulties and costs of writing and enforcing very specific performance contracts that have high costs of non-performance, particularly in a changing economic environment.

The decision to produce two or more products jointly depends primarily on cost complementarities. Modern oil refineries producing a wide spectrum of petroleum products such as gasoline, jet fuel, diesel oil, asphalt, and petrochemicals are classic examples of joint production. Technically, it is possible to design oil refineries to produce only one product such as gasoline, but the costs would be prohibitive compared to producing the mix.

2. The Subsidiary Structure: When Is It Useful? When Is It Wasteful?

The firm's choice of management structure can vary widely ranging from stand-alone

subsidiaries with separate management to a highly integrated, centralized management control. Again the choice is likely to depend on transaction costs and cost complementarities. A subsidiary structure is often useful. But when it is desirable, it is usually for a business endeavor with a different focus than that of the parent company.

The subsidiary organization, when market driven, is an efficient structure. But subsidiaries that are regulation-mandated are seldom of the type the market would yield. Separate subsidiaries cannot typically capture the efficiencies of joint production, whereas an integrated firm structure can. When one product is somehow very dependent upon another through joint production or marketing processes, management and planning efficiencies dictate an integrated structure.[18]

B. Industry Examples Where Regulatory Constraints Have Prevented Optimal Firm Structure

1. Texas Branch Banking Prohibitions

An example of an imposed subsidiary structure is Texas banking prior to the 1990s. The state of Texas, wary of large banks, had imposed a regulatory structure prohibiting branch banks but allowing subsidiary banks. They were not called subsidiaries, as they were not originally envisioned to be subsidiaries, but that is what they ended up being. The banks were called "unit banks" or "stand alone" banks. The unit banking structure in Texas prevented branching. A branch is a separate office that accepts deposits and makes loans, but it is still operated under the one corporate bank management as a separate office location. Contrast the banking organizations in Texas with those in California, where branching was allowed. A bank like the Bank Of America has many branch offices throughout the state of California under one management. In Texas each stand alone banking facility had to be a totally separate company, with separate management and separate capitalization. This unit banking structure led to unnecessary duplication costs and inconvenience to consumers who

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[18] For more discussion about the way transactions costs determine firm structure see Oliver E. Williamson, "The Modern Corporation: Origins, Evolution, Attributes", *Journal of Economic Literature* (Dec. 1981), pp. 1537-1568.

found they could cash a check at only one banking location.[19] Because of the inability to fund large loans by any one unit bank, larger banking organizations developed in Texas, called Bank Holding Companies, which managed the unit banks they owned. The bank holding companies chose the management of the subsidiary or unit banks, and their loan participation policies. In this sense, the subsidiary structure prevailing in Texas banking was less restrictive than the subsidiary structure envisioned for the BOCs, because it involved less management separation and more coordination of purposes between the parent and subsidiary companies.

With the easing of bank regulations in Texas, the market has delivered a much heavier reliance on branch banking, leaving the unit bank as an artifact of the past. The lesson from Texas banking for telecommunications is clear. Imposing a subsidiary structure on BOCs for provision of enhanced services would impose costs on consumers of enhanced services, as they pay for the inefficiencies that structure imposes.

2. Gas Pipelines and Special Marketing Affiliates

Until 1985, natural gas pipelines in the US were largely required to serve as gas merchants -- not merely transporters-- purchasing gas upstream, transporting the gas to downstream customers, and then selling the gas. Each pipeline could negotiate its purchase price of gas at the wellhead and negotiate its selling price at the delivery point. Curiously, these pipelines were not permitted to sell transport services to any willing buyer or seller. Unlike the rail and truck transport industries, natural gas pipeline companies were required to take title to all gas to be transported, thereby avoiding the suspected pitfalls of the competitive marketplace. The theory was that only if the pipeline was given the responsibility of supplying downstream customers, shortages of gas downstream would be less likely. The pipelines, under the Federal Energy Regulatory Commission (FERC) regulations, would

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[19] Studies show that accessibility is improved when branching is allowed, and the results hold for metropolitan and rural areas; see Devanoff, Douglas D., "Branch Banking and Service Accessibility", *Journal of Money, Credit and Banking*, 20(2), May 1988, pp.191-202. Also see Saving, T. R. and R. F. Lanzillotti, "State Branching Restrictions and the Availability of Banking Services", *Journal of Money, Credit and Banking*, November, 1969, pp. 778-783, in which they show that for a given population and income there are more banking offices in unit banking states than in branching states in the period they studied.

be required to maintain a constant flow of gas downstream, with the pipeline being the gas purchaser and scheduling agent.

Following the widespread abrogation of gas purchase contracts by the pipelines, FERC allowed pipelines to become common carriers, providing gas transport to any party. But should the pipelines be allowed to form "special marketing affiliates" and purchase transport services on the parent's pipeline? Special marketing affiliates were in fact allowed to be formed as subsidiaries of the pipelines, but these subsidiaries were allowed to share common personnel, offices, and computer equipment. Like an enhanced service provider, they purchased pipeline access from the parent pipeline company. To protect against access discrimination, FERC used regulatory prohibition methods rather than strict separation of facilities. Sanctions were introduced wherein pipelines might be required to allocate more of its capacity to independent gas marketing companies and/or exclude certain assets from the calculation of their rate base. In short, FERC used penalties based upon verified complaints rather than the imposition of efficiency-robbing methods of operations.

The deregulation of the pipelines opened the door for more efficient markets for natural gas to develop. Initially, local spot markets developed, enabling buyers to purchase gas at major terminals across the US. With time, these local spot markets evolved into a national spot market. By 1991, the great majority of gas transported in the US was for spot market transportation. The public benefits from the development of the spot market have been extensive, and the role of the special marketing affiliates has facilitated the process.

3. Deregulation of the Airline Industry and the Hub and Spoke System

Support for airline deregulation was spawned by evidence from the unregulated intrastate airline markets of the 1970s. Many analysts believed a deregulated U.S. airline industry would resemble these intrastate markets that were characterized by small regional carriers operating over linear routes with very simple pricing schemes. In contrast, under Civil Aeronautics Board (CAB) regulation, the route and fare structure of the airlines industry were set by regulation.

Following deregulation, the present airline industry in no way resembles the anticipated examples of the small regional, intrastate carriers. But many of the favorable outcomes of deregulation predicted by observers of the industry have been realized. Deregulation has enabled

airlines to reduce operating costs, increase load factors, increase the availability of discount tickets, and increase the number of flights, all without a serious decline in service to small communities or safety.

Many of the fundamental attributes that now characterize the domestic airline industry, such as the hub-and-spoke method of delivery, complex pricing schemes, the dominance of many airports by single carriers, the importance of computer reservation systems, and the growth of loyalty-inducing devices (frequent-flyer programs and travel agent commission overrides) did not exist in the regulated airline industry, and they were not predicted to emerge from deregulation. Recent econometric evidence shows that deregulation led to substantial efficiency gains, resulting from lower labor costs, higher load factors, and more efficient route structures.[20]

Of particular relevance for telecommunications is the advent of the hub-and-spoke system. Deregulation fundamentally altered the route structures of airlines from linear routes imposed by regulation to a hub-and-spoke pattern. Economies of density forced greater concentration of flights between hubs. Likewise, travel to "spoke" cities was driven by the lower cost of moving traffic along an individual route.

All major airlines now have one or more hubs at which many of their long-distance passengers change planes. Since most hub airports can accommodate large-scale operations of only one airline, both logistically and economically, competition has tended to decrease on direct routes to and from the hubs. Yet, because a hub allows an airline to serve a large number of routes with a change of plane at the hub, longer routes are now served by more airlines, each channeling passengers through its particular hub airport. This explains the decline in concentration on longer routes and the increase on shorter routes. On balance, the expansion of the airline networks has produced a significant increase in the number of routes jointly served by major carriers.

The important lesson is that just as market forces caused the unanticipated evolution of the

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[20] Research describing the changes in the airlines industry include Baltagi, Badi, Griffin, J.M. and Daniel Rich, "Airline Deregulation: The Cost Pieces of the Puzzle", *International Economic Review*, February 1995 Borenstein, Severin, "The Evolution of U.S. Airline Competition." *Journal of Economic Perspectives*, Spring 1992, p. 45-73; Evans, William N., "Structure, Conduct, and Performance in the Deregulated Airline Industry", *Southern Economic Journal*, January 1993, p. 450-67.

hub-and-spoke route system, market forces in telecommunications may favor certain products being produced jointly. Just as no one predicted the emergence of the hub-and-spoke system, we should not expect regulators to be able to predict which types of firm structures will and will not have cost complementarities.

C. It Is Difficult for Regulators to Know the Optimal Firm Structure

Transactions costs should determine whether an objective is accomplished by a firm through interfirm contracts in the marketplace or provided within the firm; likewise, cost complementarities should determine whether production is jointly or separately organized. Since it is very difficult for regulators to assess the alternative costs of organizing production, it is very difficult for regulators to know the optimal firm structure. Transactions costs change over time due to changed market conditions, changes in relative prices, and changes in technology. Similarly, the extent of cost complementarities is technology driven. Regulators imposing firm structure have the impossible task of assessing when these costs have changed and selecting the most efficient firm structure.

Regulators, like the economic planners in the former Soviet Union, typically do not possess either the knowledge of these changing forces or the resources to acquire that knowledge. Examples from other industries show that regulatory constraints have often prevented regulated firms from adopting efficient firm structures as evidenced by the dramatic and unpredicted changes following deregulation. In sum, historical experience argues strongly that firm structure should be market-determined.

APPENDIX A

US WEST Enhanced Services Product Status

Product	APPROVED CEI	APPROVED Listed Under CEI filed 3/13/95	NOT YET APPROVED New/Within Six Months
Voice Messaging Service	✔		
Protocol Processing Services	✔		
Voice Storage Service (Trial)	✔	(inactive)	
Electronic Messaging (Trial)	✔	(inactive)	
Community-Link	✔	(Inactive)	
VMS - Parent Teacher Exchange (School Link)	✔		
VMS - Home Metro		✔	
VMS - Extension Mailboxes (shared)		✔	
VMS - Guest Mailbox		✔	
VMS - Enhanced Call Processing and Call Routing		✔	
VMS - Listen Only Mailboxes		✔	
VMS - Spanish Only Mailboxes		✔	
VMS - Voice Forms		✔	
VMS - Stand Alone Mailboxes		✔	
Point of Sale		✔	
Easy Source Audiotex		✔	
FAX Mail		✔	
FAX Request		✔	
Never Busy FAX		✔	
FAX Mail Plus		✔	
Broadcast FAX		✔	
Electronic Classifieds		✔	
Interact Message Switching Service (protocol conversion)		✔	
Your Value Card		✔	
GOTv		✔	
Interactivities		✔	
On-Line Access Marketing Lists		✔	
Audio Magazine		✔	
Call Tally		✔	
U S Avenue		✔	

US WEST Enhanced Services Product Status (continued)

Product	APPROVED CEI	APPROVED Listed Under CEI filed 3/13/95	NOT YET APPROVED New/Within Six Months
Kiosk Ticketing		✔	
News On Demand			✔
VMS - Notification			✔
VMS - Retail			✔
VMS - Hands Free			✔
VMS - Home Office			✔
Directory Assistance Plus			✔
Data Archiving and Retrieval			✔
Automated Infovault			✔
Internet Express			✔
Interprise Netware Connect			✔
Additional Enhancements on Interact			✔
Geographic Information Services			✔
Database Management Services			✔
RealTime Interactive Database Marketing			✔
Broadband PC - Broadband Team - Mass Markets			✔
Electronic Directory Assistance (pending FCC waiver)			✔
Video Dial Tone and application enhancements			✔
Video On Demand Training			✔
Information Service Ticketing			✔
Information Service Topic Board			✔
Multimedia Mailbox			✔
VMS Universal Mailbox			✔
VMS Media			✔
VMS FAX			✔